Both warm water soaking and matricconditioning treatments enhance anti-oxidation of bitter gourd seeds germinated at sub-optimal temperature

This study evaluated the effects of warm water soaking and matricconditioning on anti-oxidative activities of germinating bitter gourd (Momordica charantia L.) seeds. The seeds were either soaked in 50 C water for 60 min or primed with moistened vermiculite at 25 C for 36 h, followed by air-drying back to their initial moisture level. A portion of the seeds were also subjected to soaking and subsequent priming. All the treated and non-treated (control) seeds were germinated at 25 or 20 C. Results indicated that the sub-optimal temperature of 20 C decreased germination rate, increased malondialdehyde and total peroxides accumulation and reduced anti-oxidative defense systems of bitter gourd seeds, suggesting that sub-optimal temperature effects were associated with lipid peroxidation. At both 25 and 20 C conditions, water-soaked and primed seeds showed marked increases in the activities of anti-oxidative enzymes and the levels of antioxidants in germinating seeds. Significant improvements in germination percentage and germination speed were also observed for water-soaked and primed seeds as compared with control. There is a positive association between the anti-oxidative capacity retained in the treated seeds and germination rate in the tested bitter gourd cultivar.